and thence

$$\tan^2 \tfrac{1}{2} \Delta' = \frac{1 - \tan \tfrac{1}{2}(90^\circ - \Delta)}{1 + \tan \tfrac{1}{2}(90^\circ - \Delta)} = \tan \tfrac{1}{2} \Delta,$$

the required relation.

We have moreover

$$\begin{aligned} \mathrm{N\,C} = 1 - \tan \tfrac{1}{2}(90^\circ - c) &= \mathrm{A\,M} \left\{ \tan \tfrac{1}{2} \Delta' - \tan \tfrac{1}{2}(\Delta' - c') \right\} \\ &= \sin \Delta' \left\{ \tan \tfrac{1}{2} \Delta' - \tan \tfrac{1}{2}(\Delta' - c') \right\} \\ &= 2 \sin^2 \tfrac{1}{2} \Delta' - \sin \Delta' \tan \tfrac{1}{2}(\Delta' - c'), \end{aligned}$$

that is

$$\begin{aligned} \tan \tfrac{1}{2}(90^\circ - c) &= \cos \Delta' + \sin \Delta' \tan \tfrac{1}{2}(\Delta' - c') \\ &= \frac{\cos \tfrac{1}{2}(\Delta' + c')}{\cos \tfrac{1}{2}(\Delta' - c')}, \end{aligned}$$

or, what is the same thing,

$$\frac{1 - \tan \tfrac{1}{2} c}{1 + \tan \tfrac{1}{2} c} = \frac{1 + \tan \tfrac{1}{2} c' \tan \tfrac{1}{2} \Delta'}{1 + \tan \tfrac{1}{2} c' \tan \tfrac{1}{2} \Delta'},$$

that is

$$\tan \tfrac{1}{2} c = \tan \tfrac{1}{2} \Delta' \tan \tfrac{1}{2} c',$$

which is the required relation between c and c'. In the particular case $\Delta = \Delta' = 90^\circ$, the two projections coincide, and we have, as we should do, $c' = c$.

Note respecting Solar Spots visible to the Naked Eye.

By A. R. Hill, Sub. Lieut. R.N.

On Sunday, 22d May, at from about 5 to 6.30 P.M., the extreme light of the Sun being obscured by a peculiar scud drifting over it, and giving the whole disk a reddish appearance, with the borders less luminous than the centre, I observed three large spots, A, B, and C, as in diagram, fig. 1, distinctly visible with the naked eye, especially A and B, A being the most distinct, and C being only visible at times, when the ardour of the Sun's rays was diminished more than at others.

On Monday, 23d, at about the same time P.M., the atmosphere being still in the same state as on the previous day, but more advantageous for naked-eye observations, I observed the spots, A, B, and C again, C being more distinct than on the previous evening; and also another spot, D, fig. 2.; but this latter being only visible at the most advantageous intervals.

During these two days the barometer averaged about 30·20 in. and thermometer, Fahrenheit, 66° in the shade at the times of observation.

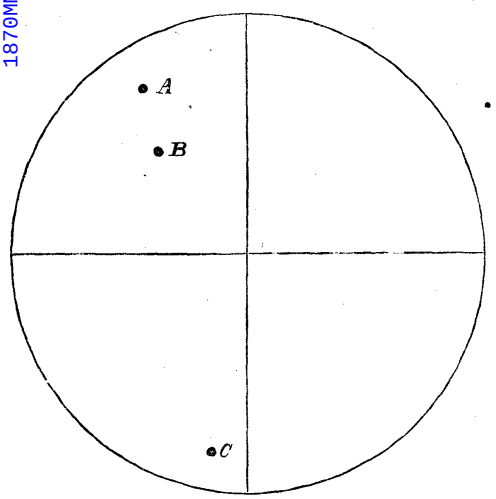

Fig. 1.

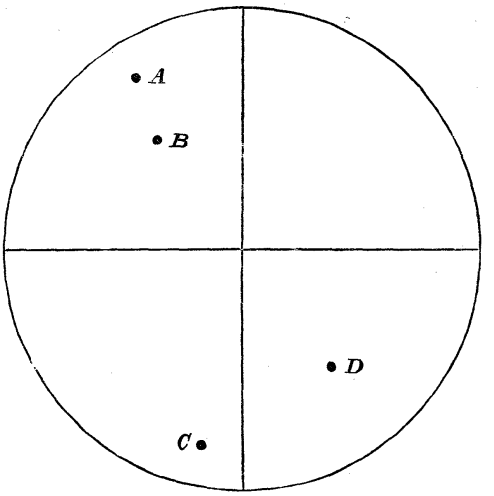

Fig. 2.

Norton, Presteign, Radnorshire,
May 30th, 1870.

Winnecke's New Comet.

(*Extract of a Letter from Dr. Winnecke to Mr. Hind, dated Carlsruhe, May* 31.)

"You have probably received through the Vienna Academy the news of a small comet discovered by me in the night, May 29–30, in *Pisces*.

"I can send you to-day the following observations:

			Comet − Star.	
May 29	$14^h\ 12^m\ 38^s$ M.T. Carlsruhe	$\Delta\alpha = +\ 0^m\ 13^s{\cdot}55$		8 Comp.
	$14\ 13\ 22$,,	$\Delta\delta = +\ 0'{\cdot}\ 9''{\cdot}9$		5 Comp.

The star of comparison is only to be found in the *Bonner Durchmg.* 9.3, 1855·0.

$$\alpha = 0^h\ 47^m\ 55^s{\cdot}9 \qquad \delta = +\ 29°\ 1'{\cdot}5$$

The last night was very cloudy, so that I have got but 3 comp. with a star twice observed by Argelander, *Bonn. Beob.* VI. + 28° No. 159.

M.T. Carls.	Comet's R.A.	Comet's Decl.
May 30 $14^h\ 13^m\ 34^s$	$= 0^h\ 50^m\ 9^s{\cdot}55$	$= +\ 28°\ 52'\ 18''$

The comet is a round, pretty bright nebula, of about $2\frac{1}{2}$ minutes in diameter"